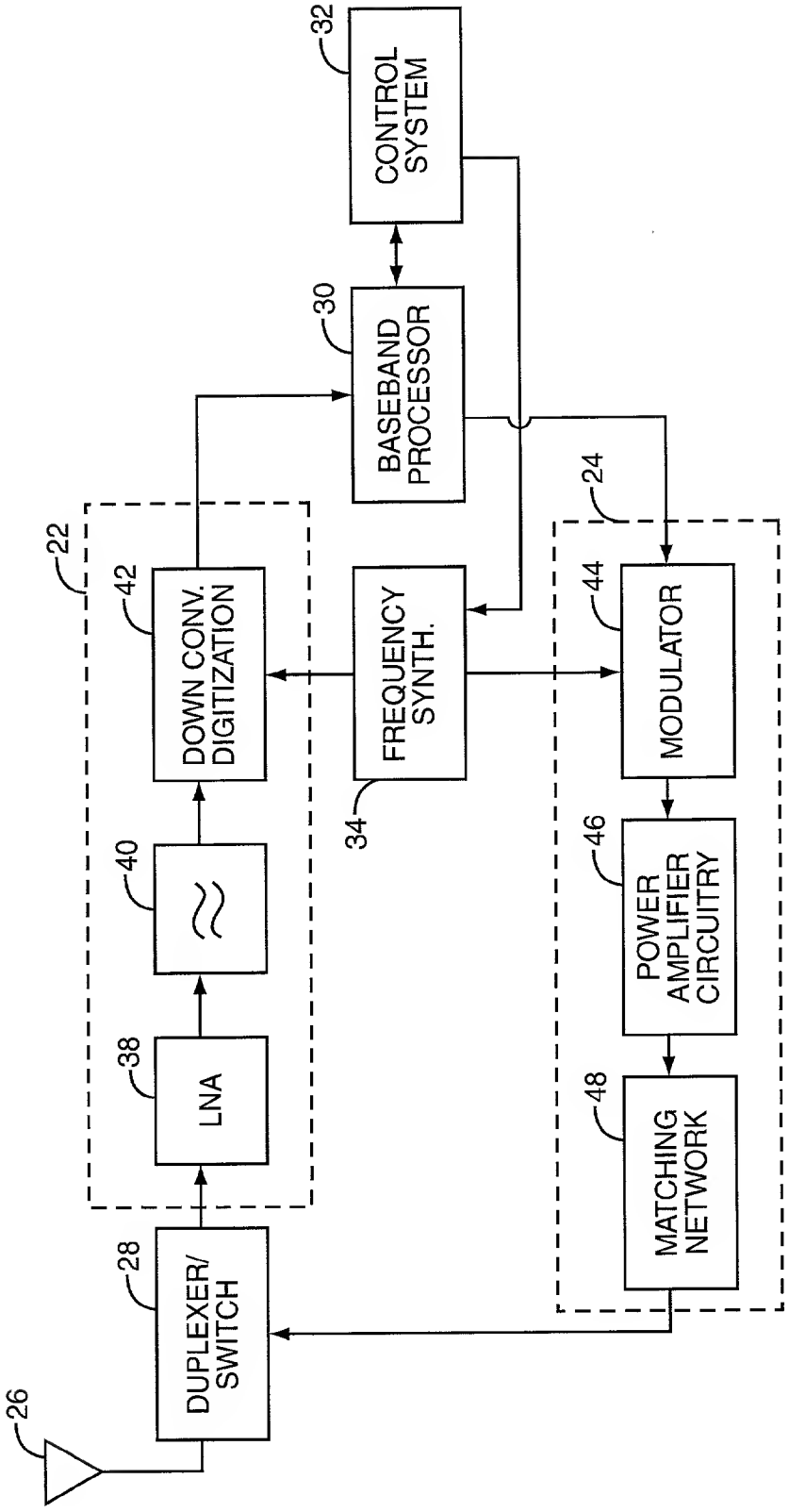
20
26
28
DUPLEXER/ SWITCH
38
LNA
40
42
DOWN CONV. DIGITIZATION
22
34
FREQUENCY SYNTH.
30
BASEBAND PROCESSOR
32
CONTROL SYSTEM
24
44
MODULATOR
46
POWER AMPLIFIER CIRCUITRY
48
MATCHING NETWORK

FIG. 1

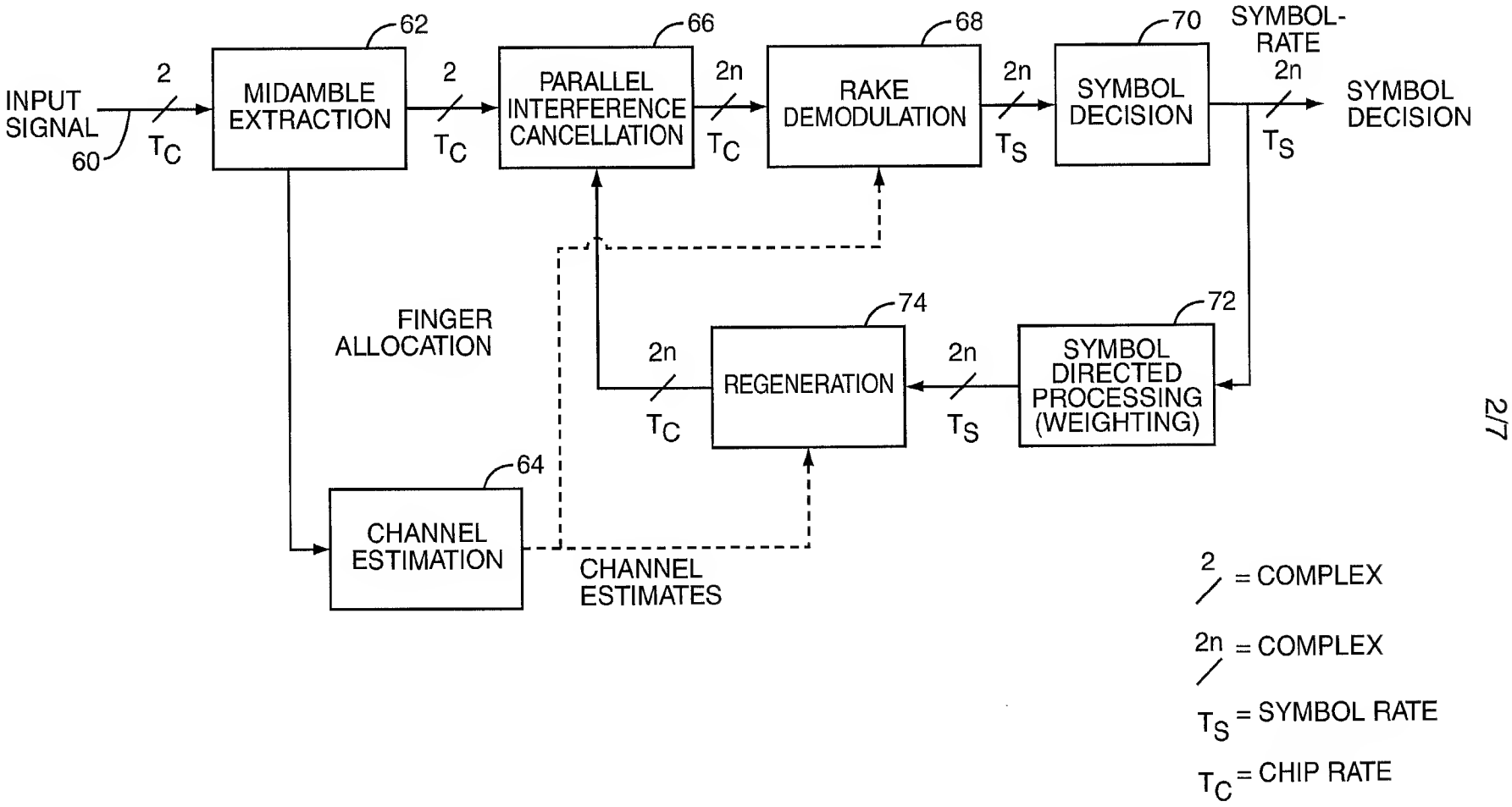
INPUT SIGNAL
60
2
T_C
62
MIDAMBLE EXTRACTION
2
T_C
66
PARALLEL INTERFERENCE CANCELLATION
2n
T_C
68
RAKE DEMODULATION
2n
T_S
70
SYMBOL DECISION
SYMBOL-RATE
2n
T_S
SYMBOL DECISION
FINGER ALLOCATION
74
REGENERATION
2n
T_C
2n
T_S
72
SYMBOL DIRECTED PROCESSING (WEIGHTING)
64
CHANNEL ESTIMATION
CHANNEL ESTIMATES
2 = COMPLEX
2n = COMPLEX
T_S = SYMBOL RATE
T_C = CHIP RATE

FIG. 2

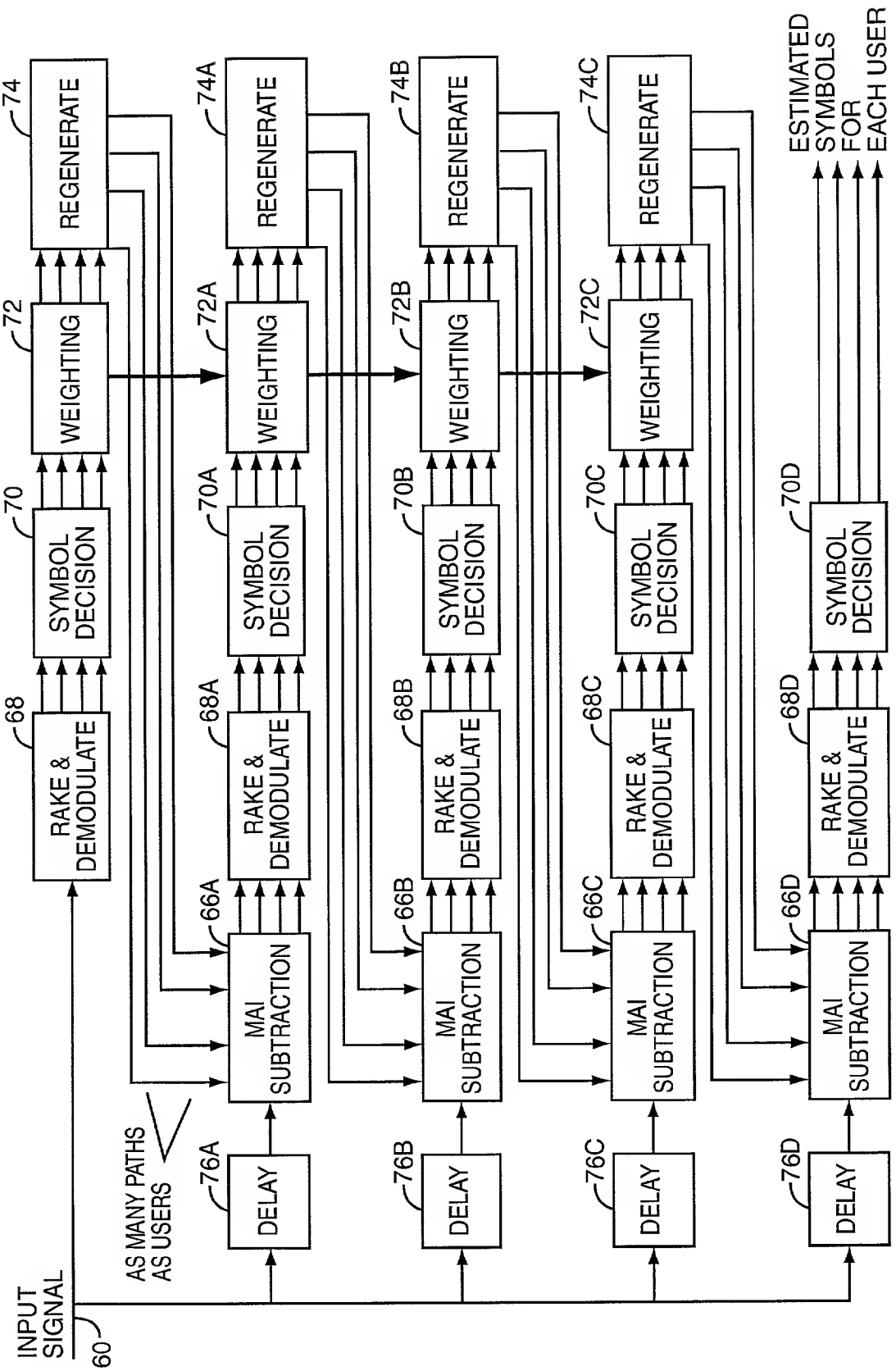
INPUT SIGNAL
60
AS MANY PATHS AS USERS
RAKE & DEMODULATE
68
SYMBOL DECISION
70
WEIGHTING
72
REGENERATE
74
MAI SUBTRACTION
66A
DELAY
76A
68A
70A
72A
74A
66B
76B
68B
70B
72B
74B
66C
76C
68C
70C
72C
74C
66D
76D
68D
70D
ESTIMATED SYMBOLS FOR EACH USER

FIG. 3

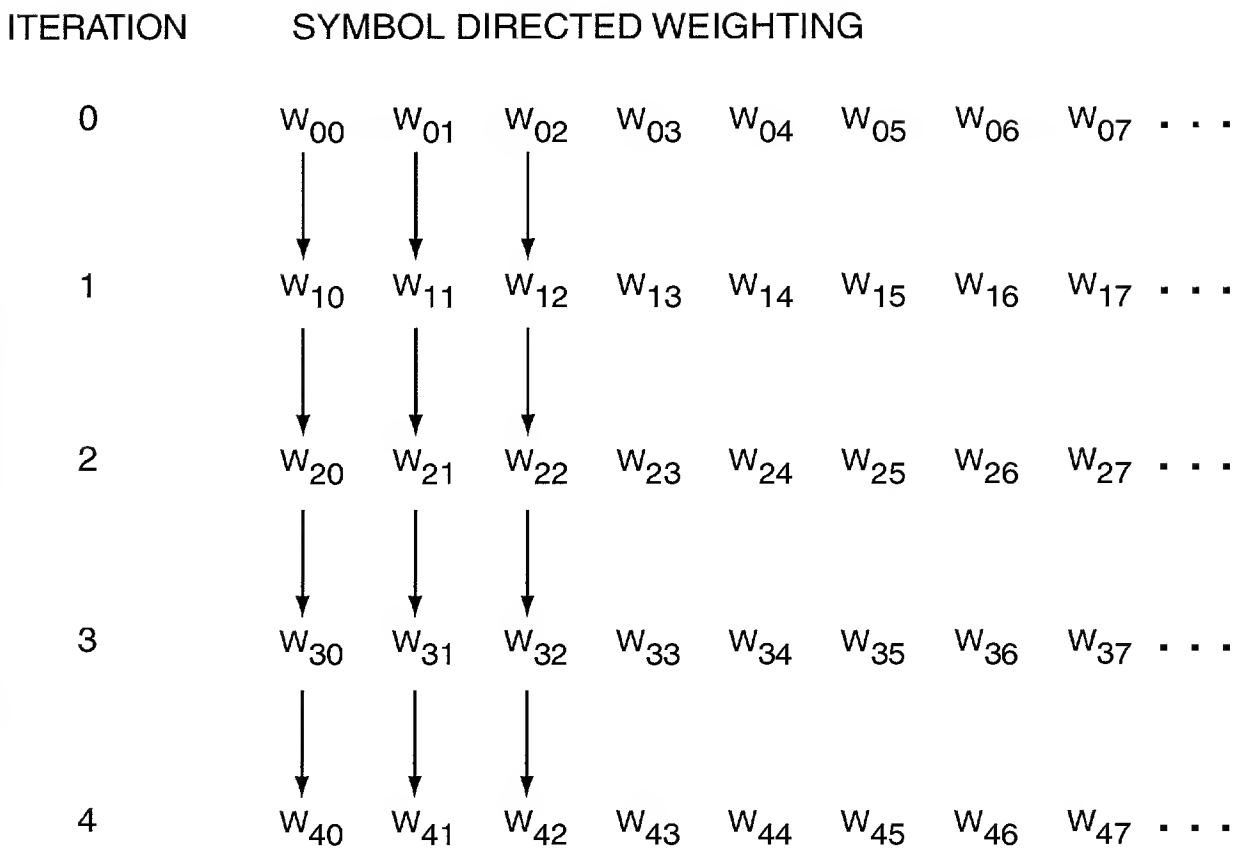
ITERATION
SYMBOL DIRECTED WEIGHTING
0
1
2
3
4
W_{00} W_{01} W_{02} W_{03} W_{04} W_{05} W_{06} W_{07} . . .
W_{10} W_{11} W_{12} W_{13} W_{14} W_{15} W_{16} W_{17} . . .
W_{20} W_{21} W_{22} W_{23} W_{24} W_{25} W_{26} W_{27} . . .
W_{30} W_{31} W_{32} W_{33} W_{34} W_{35} W_{36} W_{37} . . .
W_{40} W_{41} W_{42} W_{43} W_{44} W_{45} W_{46} W_{47} . . .

FIG. 4

$$\text{WEIGHTED SYMBOL} = \frac{BK * \text{SYMBOL}}{1 - (1 - A_K) Z^{-1}}$$

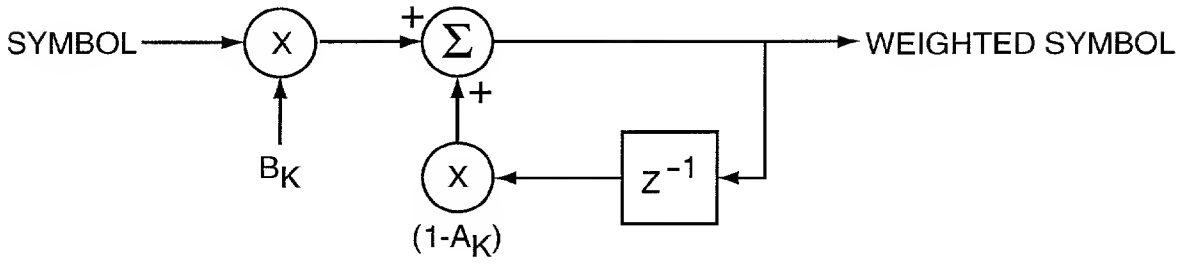

FIG. 5

$$\text{WEIGHTED SYMBOL} = \left[\frac{\text{SYMBOL}}{1 - Z^{-1}}\right] * \left[\frac{1}{N}\right]$$

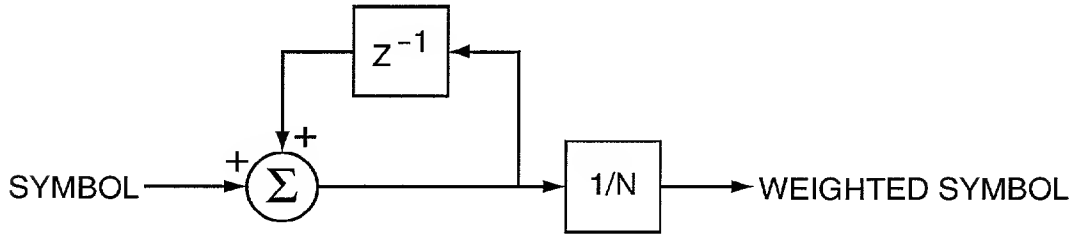

FIG. 6

LOOK-UP TABLE

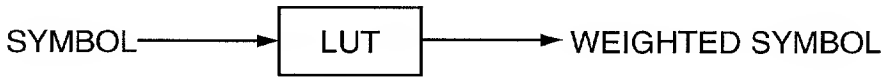

FIG. 7

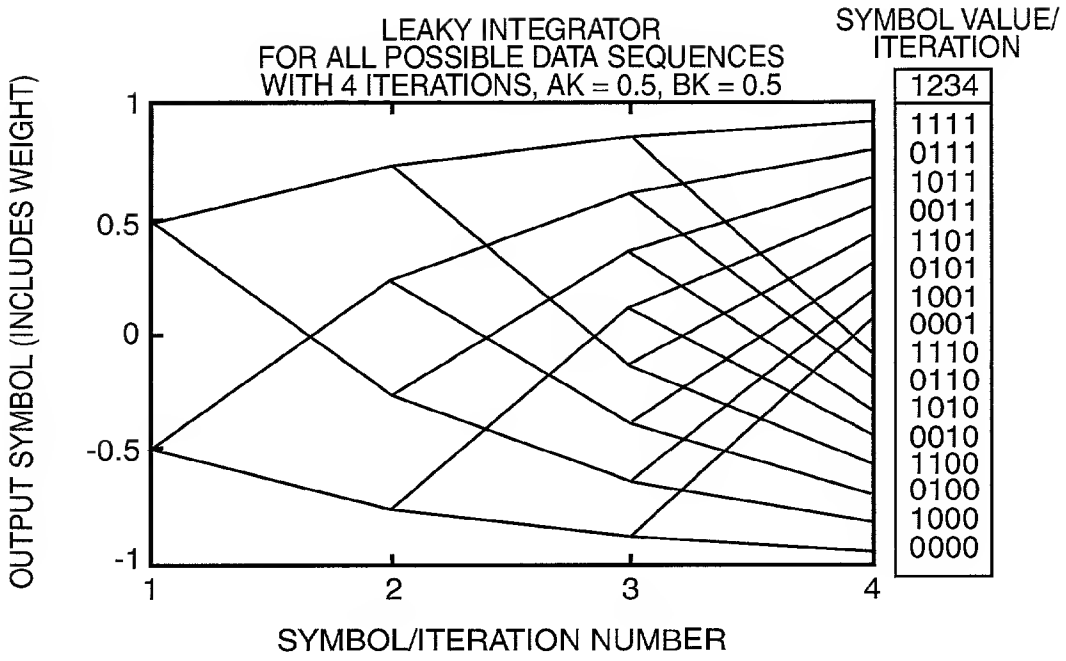
LEAKY INTEGRATOR
FOR ALL POSSIBLE DATA SEQUENCES
WITH 4 ITERATIONS, AK = 0.5, BK = 0.5
SYMBOL VALUE/
ITERATION
1234
1111
0111
1011
0011
1101
0101
1001
0001
1110
0110
1010
0010
1100
0100
1000
0000
OUTPUT SYMBOL (INCLUDES WEIGHT)
1
0.5
0
-0.5
-1
1
2
3
4
SYMBOL/ITERATION NUMBER

FIG. 8

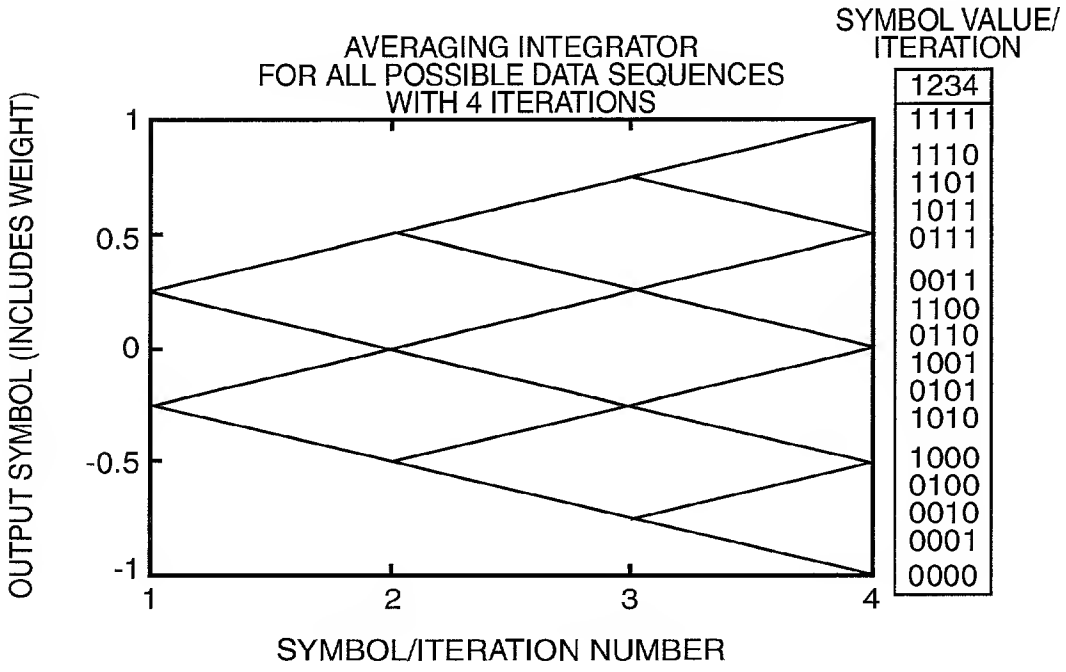
AVERAGING INTEGRATOR
FOR ALL POSSIBLE DATA SEQUENCES
WITH 4 ITERATIONS
SYMBOL VALUE/
ITERATION
1234
1111
1110
1101
1011
0111
0011
1100
0110
1001
0101
1010
1000
0100
0010
0001
0000
OUTPUT SYMBOL (INCLUDES WEIGHT)
1
0.5
0
-0.5
-1
1
2
3
4
SYMBOL/ITERATION NUMBER

FIG. 9

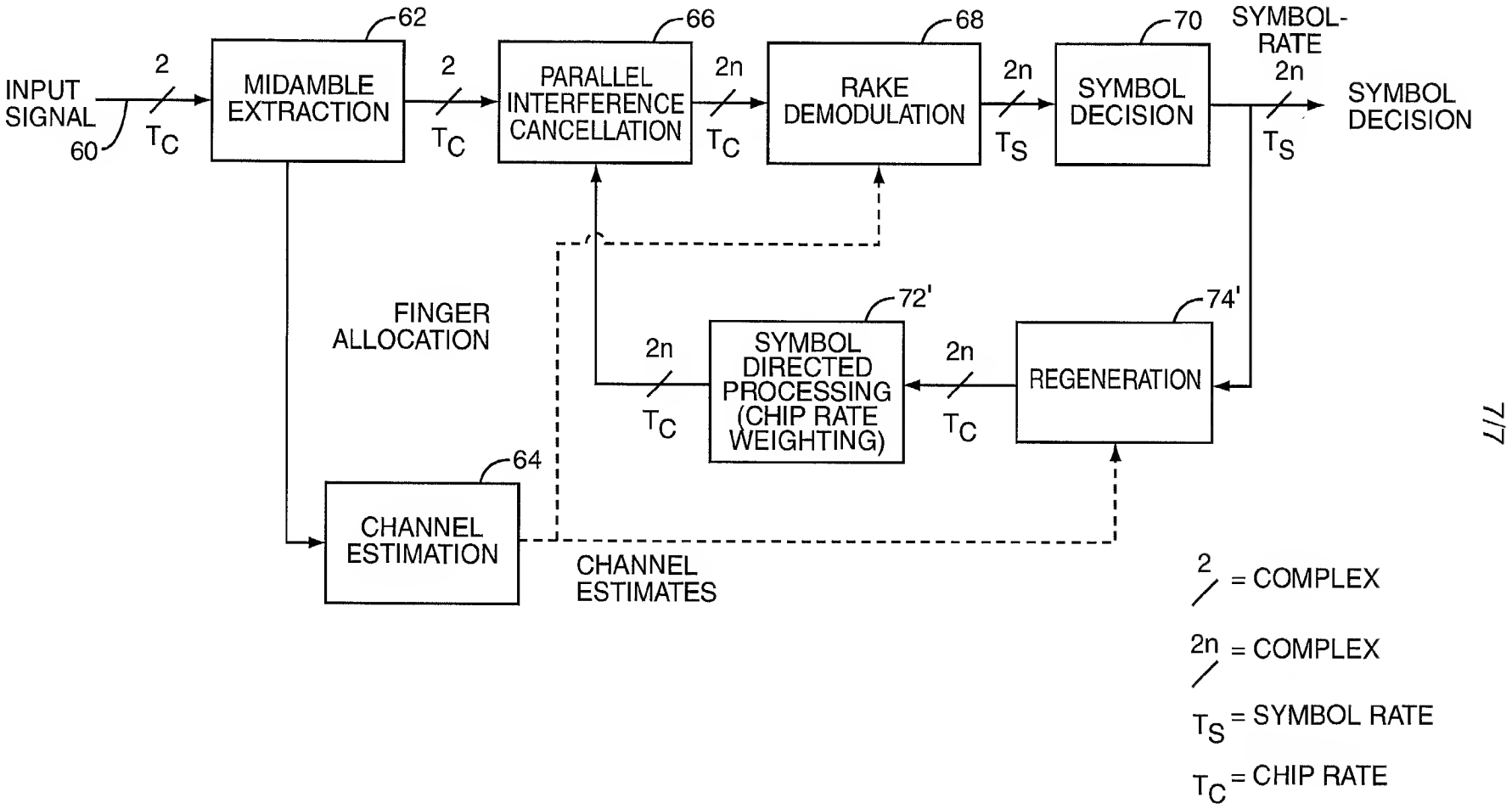
INPUT SIGNAL
60
2
T_C
MIDAMBLE EXTRACTION
62
2
T_C
PARALLEL INTERFERENCE CANCELLATION
66
2n
T_C
RAKE DEMODULATION
68
2n
T_S
SYMBOL DECISION
70
SYMBOL-RATE
2n
T_S
SYMBOL DECISION
FINGER ALLOCATION
SYMBOL DIRECTED PROCESSING (CHIP RATE WEIGHTING)
72'
2n
T_C
REGENERATION
74'
2n
T_C
CHANNEL ESTIMATION
64
CHANNEL ESTIMATES
2 = COMPLEX
2n = COMPLEX
T_S = SYMBOL RATE
T_C = CHIP RATE

FIG. 10